Trend Study 18-30-02

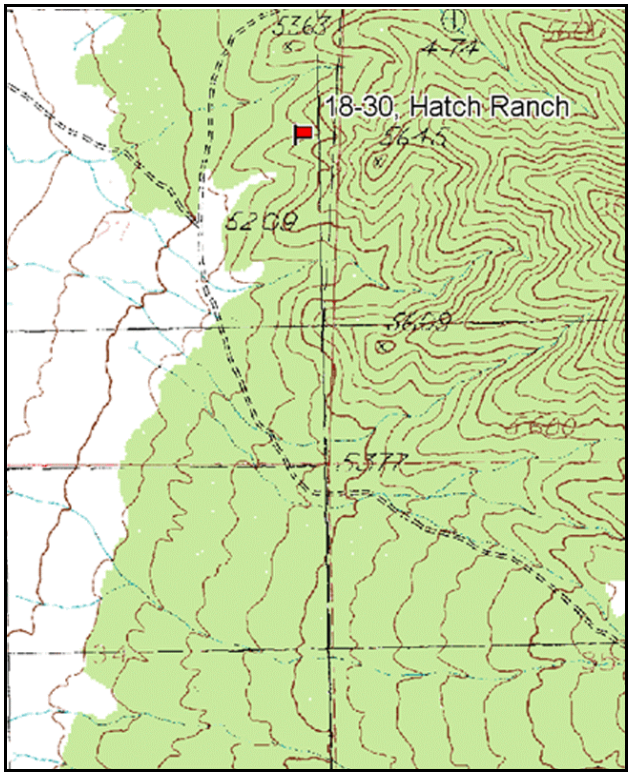
Study site name: Hatch Ranch . Vegetation type: Stansbury Cliffrose .

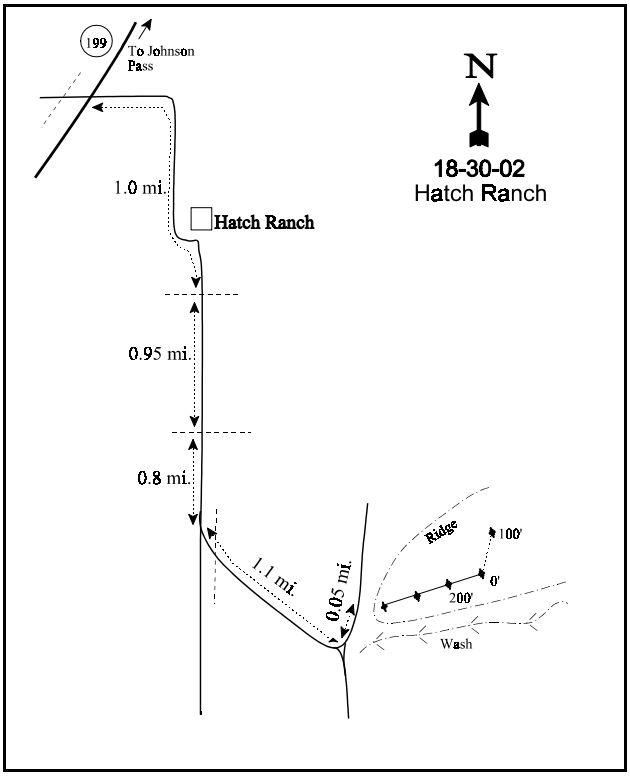
Compass bearing: frequency baseline 18 degrees magnetic (Lines 2-4 @ 250°M).

Frequency belt placement: line 1 (11 & 95ft), line 2 (34ft), line 3 (59ft), line 4 (71ft).

LOCATION DESCRIPTION

Across from the Old Lincoln Road, turn east off of U-199. Go east and south 1.0 mile to the Hatch Ranch. From the south gate, continue down the valley 0.95 miles to another gate. Continue 0.8 miles on the main road to a fork that angles southeast through a gate. Take this fork 1.1 miles to a fork at the base of the Onaqui Mountains. Bear left, going just 300 yards to the base of a ridge. From here, walk up the ridge about 400 yards to the 0-foot baseline stake on the ridge top. It is a short green fencepost marked with browse tab #9081.





Map Name: Johnson Pass

Diagrammatic Sketch

Township 6S , Range 7W , Section 26

GPS: NAD 27, UTM 12S 4458557 N 362933 E

DISCUSSION

Hatch Ranch - Trend Study No. 18-30

This study samples severe winter range located at the base of the Onaqui Mountains, approximately three miles south-southeast of Hatch Ranch. It is an area of low hills and ridges occupied by a scattered, relatively low density juniper-pinyon woodland and low density cliffrose mixed with Wyoming big sagebrush. The lower elevation flats are occupied by extensive areas of Wyoming big sagebrush and shadscale saltbush. Elevation of the study is 5,600 feet with a moderately steep slope (17%) and a southwest aspect. The entire area is rather depleted of understory herbs, especially forbs. Cheatgrass is widespread and often very dense. The area is administered by the BLM and is permitted for cattle grazing, which was underway at the time of study establishment in 1983. Little sign of cattle use was noted in 1997 or 2002. Deer use has been moderate during all sampling periods. Pellet group quadrat frequency was 40% in 1997. Pellet group transect data from 2002 estimated 31 deer days use/acre (76 ddu/ha). There was also sign of wild horses in the area but none on the site itself. Stud piles were found down slope from the site and 10 wild horses were seen on the sagebrush flat near the site during the 2002 reading.

Soil condition is poor with one-third of the ground covered with rock or pavement. Effective rooting depth is shallow averaging only 6 inches. The soil is obviously deeper but the rocky nature of the soil limited soil penetrometer readings. Soil temperature is high due to the rocky soil and shallow depth, averaging 74° F at 8 inches. Soil texture is a clay loam with a neutral reaction (pH 7.1). Only minimal herbaceous vegetation or litter cover is available to protect the shallow and extremely rocky soil. About 40% of the ground surface is occupied by rock, erosion pavement, or bare soil. Cryptogams comprise a significant amount of the ground cover. Although the rate of soil erosion has been severe in the past, it was considered negligible or quite low in 1997 and 2002. There is little bare ground exposed and the erosion condition class was determined as stable in 2002.

The key browse species are Stansbury cliffrose and Wyoming big sagebrush, which provide most of the browse cover. Wyoming big sagebrush has maintained a stable density of around 1,000 plants/acre since study site establishment in 1983. Utilization in 1983 was heavy but vigor remained good on most plants and percent decadence was low at only 9%. Use since then has been light with a few plants displaying moderate or heavy use. Vigor has been good with the exception of 1997 when 26% of the mature sagebrush were classified as chlorotic and nearly all of the decadent shrubs were classified as dying. By 2002, vigor has improved and the stand appears to be stable.

The site supports a mostly mature stand of cliffrose which has been moderately to heavily hedged on available plants during most years. Density was estimated at just under 600 plants/acre in 1983 and 1989. The much larger sample used in 1997 and 2002 estimated a higher density of respectively 780 plants/acre and 1,200 plants/acre. Vigor has been good on most plants during all readings and besides a moderately high number of decadent plants in 1989, percent decadence has remained relatively low. Young recruitment was good in 1997 and 2002 indicating a slowly expanding population.

Several other shrub species can also be found. However, most occur infrequently and are generally low in palatability. The most numerous is broom snakeweed, an aggressive increaser, which had a high density of 12,920 plants/acre in 1997. Drought conditions in 2002 have caused a dramatic decline to only 520 plants/acre.

Understory grasses, especially forbs, are sparse and generally of low forage value. Total herbaceous cover was estimated at only 15% in 1997, declining to 8% in 2002. Barren areas and patches of nearly pure cheatgrass brome occupied more surface area than any other class of vegetation in 1997. The most palatable and abundant perennial herbaceous species is bluebunch wheatgrass, a population which contains both the hairy and bearded subspecies. The fire hazard in this area varies from moderate to high, depending upon cheatgrass density. Several forbs are found on the site but only a few occur more than occasionally. Total cover of forbs is low averaging only 1% cover in 1997 and less than one-half of 1% cover in 2002.

1983 APPARENT TREND ASSESSMENT

Soil is poor. Very little effective litter or vegetational cover is available to hold soil in place. As a result, erosion is proceeding at a rapid rate. Aside from an apparent increase in broom snakeweed, trend for the major browse populations appears stable or perhaps even improving. Herbaceous understory condition is poor and not improving.

1989 TREND ASSESSMENT

These foothill ridges provide a diversity of browse forage not found in the large basins below where Wyoming big sagebrush dominates. Cliffrose is the preferred species and is heavily utilized by both deer and livestock. In 1983, the study was conducted when cattle were present. During the reading in 1989, evidence of sheep use was observed. Since 1983, the cliffrose has shown signs of increased decadence (from 6% to 38%). The majority are classified with heavy use (44%). Density has changed slightly downward from 599 plants/acre to 532 plants/acre. A few young and seedlings were counted. There are conflicting indicators of trend in the age class structure and the increase in frequency make it difficult to predict trends in the population that is relatively long-lived. The composition and populations of other browse species are essentially stable. Vigor and utilization of the Wyoming big sagebrush are acceptable, and density is slightly higher at 1,233 plants/acre. The herbaceous component appears to have improved somewhat, contrary to the 1983 assessment. There was an increase in grass frequency, due mainly to increases in Sandberg bluegrass. While the diversity of grasses is still low, the number of forb species identified increased from 4 to 10 and there is a higher frequency of forbs. The site is very rocky and steep, but erosion is not excessive for the type of site. Soil is definitely a limiting factor. There are cryptogams and mosses on the bare areas.

TREND ASSESSMENT
soil - stable (3)
browse - stable (3)
herbaceous understory - slightly upward (4)

1997 TREND ASSESSMENT

The trend for soil is improved, but still in poor condition. Percent bare soil has decreased to 6%, however rock and pavement still cover 33% of the surface. The two key browse species are cliffrose and Wyoming big sagebrush. The cliffrose which makes up 38% of the browse cover, appears to be experiencing an upward trend. Some of these characteristics include good biotic potential (number of seedlings), good age class structure (mature and young age classes) for a long-lived species, reduced decadence, mostly light use, and an increase in the population. For Wyoming big sagebrush, we see another scenario. We have a population that is slightly more decadent, an increased number of plants classified with poor vigor, the young age class has decreased to only 10%, while the mature age class has increased to 73%. This is not good for a relatively short-lived shrub. The ratio of dead to live plants is poor (1:3.3). The population has decreased by 22%, but this can be explained by the number of dead plants in the population. The one desirable characteristic the population has is that the biotic potential (# of seedlings) is relatively high at 33%. This one encouraging characteristic could compensate for its decrease in numbers, but it will not be readily recognizable until the next reading in 2002. Broom snakeweed is also another browse that is relatively abundant. It is not utilized, yet it can be an indicator of other problems. Currently it has increased to 12,920 plants/acre. There are no seedlings and the mature age class now makes up 83% of the population, indicating its population will eventually go down. Large swings in its population (either up or down) would be expected. Trend for key browse is considered stable, with the increases in cliffrose compensating for the losses in the sagebrush. The herbaceous understory trend is slightly downward with the perennial component showing losses. It is still in poor condition with two weedy species (cheatgrass and bur buttercup) making up more than 57% of the herbaceous cover.

TREND ASSESSMENT
soil - slightly improved, but still poor condition (4)
browse - stable (3)
herbaceous understory - slightly down (2)

2002 TREND ASSESSMENT

Trend for soil is down slightly and condition is poor. Rock and pavement cover over one-third of the surface. Cover of bare ground has increased slightly while cover of litter and vegetation have declined. Herbaceous vegetation cover has declined from 15% in 1997 to 8% in 2002. There is little erosion occurring. The erosion condition class was determined as stable in 2002. Trend for the key browse species, Wyoming big sagebrush and cliffrose is up slightly. Density of Wyoming big sagebrush has increased slightly as vigor has improved and young recruitment is good with 19% of the population consisting of young plants. Utilization remains mostly light. Cliffrose also shows an increase in density. It is more heavily utilized compared to 1997, but vigor remains good, young recruitment adequate, and there are few decadent plants. Trend for the herbaceous understory is mixed. Sum of nested frequency for perennial grasses has remained stable. Nested frequency of cheatgrass has declined significantly and average cover has dropped from 8% in 1997 to one-half of 1% in 2002. Sum of nested frequency for forbs has declined dramatically due to drought. Forbs were never very abundant although 16 species were identified in 1997, yet only three were sampled in 2002. Since Sandberg bluegrass, which provides 87% of the grass cover or 83% of the total herbaceous cover, has remained stable, overall trend for the herbaceous understory is considered stable.

TREND ASSESSMENT
soil - down slightly (2)
browse - up slightly (4)
herbaceous understory - stable (3)

HERBACEOUS TRENDS --
Herd unit 18 , Study no: 30

Type	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'83	'89	'97	'02	'83	'89	'97	'02	'97	'02
G	Agropyron spicatum	a17	b39	ab24	a15	8	18	9	10	.93	.58
G	Bromus tectorum (a)	-	-	b285	a73	-	-	91	30	8.10	.46
G	Oryzopsis hymenoides	-	3	6	-	-	1	3	-	.07	-
G	Poa secunda	a192	b270	b252	b269	69	88	87	90	5.09	7.00
Total for Annual Grasses		0	0	285	73	0	0	91	30	8.10	0.46
Total for Perennial Grasses		209	312	282	284	77	107	99	100	6.09	7.59
Total for Grasses		209	312	567	357	77	107	190	130	14.19	8.06
F	Agoseris glauca	-	-	3	-	-	-	1	-	.03	-
F	Alyssum alyssoides (a)	-	-	10	-	-	-	4	-	.02	-
F	Allium spp.	b10	ab6	b12	a-	5	3	7	-	.06	-
F	Antennaria rosea	-	-	4	3	-	-	2	1	.01	.00
F	Astragalus utahensis	-	1	3	-	-	1	1	-	.00	-
F	Calochortus nuttallii	3	7	1	-	1	3	1	-	.00	-
F	Chaenactis douglasii	-	2	-	-	-	1	-	-	-	-
F	Cirsium spp.	-	-	1	-	-	-	1	-	.00	-
F	Erodium cicutarium (a)	-	-	2	-	-	-	1	-	.01	-
F	Erigeron pumilus	a1	b10	ab6	a-	1	7	2	-	.03	-
F	Euphorbia spp.	-	-	5	-	-	-	3	-	.01	-
F	Haplopappus acaulis	-	6	-	-	-	2	-	-	-	-
F	Lactuca serriola	a-	b27	a2	a-	-	16	1	-	.03	-

Type	Species	Nested Frequency				Quadrat Frequency				Average Cover %	
		'83	'89	'97	'02	'83	'89	'97	'02	'97	'02
F	Lomatium spp.	-	6	-	-	-	3	-	-	-	-
F	Microsteris gracilis (a)	-	-	2	-	-	-	1	-	.00	-
F	Oenothera caespitosa	-	2	-	-	-	1	-	-	-	-
F	Phlox hoodii	-	-	9	9	-	-	4	4	.21	.36
F	Phlox longifolia	2	8	1	-	2	4	1	-	.00	-
F	Ranunculus testiculatus (a)	-	-	$_{b}$149	$_{a}$11	-	-	53	6	.74	.03
F	Townsendia incana	$_{a}$-	$_{b}$37	$_{a}$4	$_{a}$-	-	16	2	-	.06	-
Total for Annual Forbs		0	0	163	11	0	0	59	6	0.77	0.03
Total for Perennial Forbs		16	112	51	12	9	57	26	5	0.47	0.36
Total for Forbs		16	112	214	23	9	57	85	11	1.25	0.39

Values with different subscript letters are significantly different at alpha = 0.10

BROWSE TRENDS --
Herd unit 18 , Study no: 30

Type	Species	Strip Frequency		Average Cover %	
		'97	'02	'97	'02
B	Artemisia tridentata wyomingensis	34	36	3.10	3.30
B	Chrysothamnus viscidiflorus stenophyllus	13	0	.09	-
B	Cowania mexicana stansburiana	32	38	9.34	12.03
B	Gutierrezia sarothrae	87	13	7.50	.30
B	Juniperus osteosperma	5	5	4.09	4.52
B	Leptodactylon pungens	2	1	-	.03
B	Pinus monophylla	0	1	-	.00
B	Sclerocactus	1	1	-	-
B	Tetradymia canescens	2	2	.15	-
B	Tetradymia nuttallii	18	11	.38	.09
Total for Browse		194	108	24.66	20.29

CANOPY COVER -- LINE INTERCEPT
Herd unit 18 , Study no: 30

Species	Percent Cover	
	'97	'02
Artemisia tridentata wyomingensis	-	4.17
Chrysothamnus viscidiflorus stenophyllus	-	.03
Cowania mexicana stansburiana	-	14.67
Gutierrezia sarothrae	-	.02
Juniperus osteosperma	3	6.25
Tetradymia nuttallii	-	.17

Key Browse Annual Leader Growth
Herd unit 18 , Study no: 30

Species	Average leader growth (in)
	'02
Artemisia tridentata wyomingensis	1.4
Cowania mexicana stansburiana	1.7

Point-Quarter Tree Data
Herd unit 18 , Study no: 30

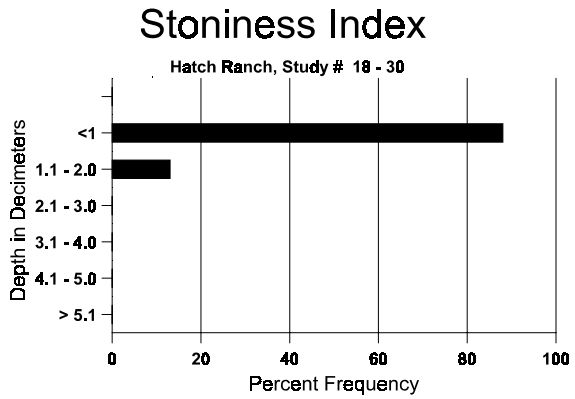
Species	Trees per Acre	Average diameter (in)
	'02	'02
Juniperus osteosperma	63	5.3

BASIC COVER --
Herd unit 18 , Study no: 30

Cover Type	Nested Frequency		Average Cover %			
	'97	'02	'83	'89	'97	'02
Vegetation	354	303	2.00	3.25	34.68	27.06
Rock	291	296	22.75	23.00	16.75	19.56
Pavement	280	285	12.00	21.25	16.10	15.42
Litter	376	354	33.75	27.25	28.58	25.79
Cryptogams	283	264	15.50	16.00	17.79	22.27
Bare Ground	180	193	14.00	9.25	6.42	9.96

SOIL ANALYSIS DATA --
Herd Unit 18, Study no: 30, Hatch Ranch

Effective rooting depth (in)	Temp °F (depth)	pH	%sand	%silt	%clay	%0M	PPM P	PPM K	dS/m
6.1	74.3 (8.4)	7.1	35.1	32.7	32.2	2.5	9.5	233.6	0.7



PELLET GROUP FREQUENCY --
Herd unit 18 , Study no: 30

Type	Quadrat Frequency	
	'97	'02
Rabbit	45	12
Deer	40	8
Cattle	1	-

Pellet Transect	
Pellet Groups per Acre	Days Use per Acre (ha)
02	02
-	-
400	31 (76)
-	-

BROWSE CHARACTERISTICS --
Herd unit 18 , Study no: 30

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Artemisia tridentata wyomingensis																		
S	83	2	-	-	-	-	-	-	-	-	2	-	-	-	66			2
	89	5	-	-	-	-	-	1	-	-	6	-	-	-	200			6
	97	16	-	-	-	-	-	-	-	-	16	-	-	-	320			16
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	83	10	-	-	-	-	-	-	-	-	10	-	-	-	333			10
	89	13	1	-	-	-	-	1	-	-	13	2	-	-	500			15
	97	4	-	-	1	-	-	-	-	-	5	-	-	-	100			5
	02	11	1	-	-	-	-	-	-	-	12	-	-	-	240			12
M	83	4	5	10	-	-	-	-	-	-	16	-	3	-	633	21	28	19
	89	11	5	2	-	-	-	-	-	-	18	-	-	-	600	20	19	18
	97	33	1	-	1	-	-	-	-	-	26	-	9	-	700	19	28	35
	02	32	1	1	3	-	-	-	-	-	37	-	-	-	740	21	30	37
D	83	-	-	3	-	-	-	-	-	-	1	-	2	-	100			3
	89	4	-	-	-	-	-	-	-	-	2	-	-	2	133			4
	97	7	1	-	-	-	-	-	-	-	1	-	-	7	160			8
	02	12	1	1	-	-	-	-	-	-	9	-	-	5	280			14
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	380			19
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	480			24

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	16%	41%	16%	+14%
'89	16%	05%	05%	-22%
'97	04%	00%	33%	+24%
'02	05%	03%	08%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	1066	Dec:	9%
	'89	1233		11%
	'97	960		17%
	'02	1260		22%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Chrysothamnus viscidiflorus stenophyllus																		
Y	83	1	-	-	-	-	-	-	-	-	1	-	-	-	33			1
	89	1	-	-	1	-	-	-	-	-	2	-	-	-	66			2
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	83	56	-	-	-	-	-	-	-	-	56	-	-	-	1866	12	17	56
	89	10	16	2	-	-	-	-	-	-	28	-	-	-	933	7	7	28
	97	12	-	1	2	-	-	-	-	-	15	-	-	-	300	9	13	15
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	9	13	0
D	83	3	-	-	-	-	-	-	-	-	1	-	2	-	100			3
	89	11	13	-	-	1	-	-	-	-	23	1	1	-	833			25
	97	3	-	-	-	-	-	-	-	-	1	-	-	2	60			3
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	60			3
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	60			3

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	03%	- 8%
'89	55%	04%	02%	-79%
'97	00%	05%	11%	
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'83	1999	Dec:		5%
'89	1832			45%
'97	380			16%
'02	0			0%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Cowania mexicana stansburiana																		
S	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	1	-	-	-	-	-	1	-	-	2	-	-	-	66			2
	97	4	-	-	-	-	-	-	-	-	3	-	1	-	80			4
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	83	-	1	1	-	-	-	-	-	-	2	-	-	-	66			2
	89	2	-	-	-	-	-	-	-	-	2	-	-	-	66			2
	97	8	-	-	-	-	-	-	-	-	8	-	-	-	160			8
	02	3	2	1	-	-	-	-	-	-	6	-	-	-	120			6
M	83	-	12	-	-	-	3	-	-	-	13	-	2	-	500	50	41	15
	89	2	1	4	-	1	-	-	-	-	8	-	-	-	266	37	24	8
	97	21	2	1	2	-	-	-	-	-	26	-	-	-	520	51	54	26
	02	12	9	22	-	1	3	-	3	-	50	-	-	-	1000	50	53	50
D	83	-	1	-	-	-	-	-	-	-	1	-	-	-	33			1
	89	-	2	2	1	-	1	-	-	-	6	-	-	-	200			6
	97	5	-	-	-	-	-	-	-	-	4	-	-	1	100			5
	02	-	1	2	-	-	1	-	-	-	4	-	-	-	80			4
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	100			5
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	140			7

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	78%	22%	11%	-11%
'89	25%	44%	00%	+32%
'97	05%	03%	03%	+35%
'02	22%	48%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
'83	599	Dec:		6%
'89	532			38%
'97	780			13%
'02	1200			7%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Gutierrezia sarothrae																		
S	83	4	-	-	-	-	-	-	-	-	4	-	-	-	133			4
	89	5	-	-	-	-	-	2	-	-	7	-	-	-	233			7
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	83	15	-	-	-	-	-	-	-	-	15	-	-	-	500			15
	89	25	-	-	-	-	-	-	-	-	23	-	2	-	833			25
	97	92	-	-	1	-	-	-	-	-	93	-	-	-	1860			93
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	83	71	-	-	-	-	-	-	-	-	71	-	-	-	2366	11	9	71
	89	97	-	-	-	-	-	1	-	-	92	-	6	-	3266	8	8	98
	97	515	-	-	18	-	-	-	-	-	533	-	-	-	10660	9	10	533
	02	20	1	-	-	-	-	-	-	-	21	-	-	-	420	5	5	21
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	16	2	-	-	-	-	1	-	-	15	-	-	4	633			19
	97	20	-	-	-	-	-	-	-	-	13	-	-	7	400			20
	02	2	-	-	-	-	-	2	-	-	-	-	-	4	80			4
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	440			22
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	7500			375

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	+39%
'89	01%	00%	08%	+63%
'97	00%	00%	01%	-96%
'02	04%	00%	15%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	2866	Dec:	0%
	'89	4732		13%
	'97	12920		3%
	'02	520		15%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Juniperus osteosperma																		
S	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	3	-	-	1	-	-	-	-	-	4	-	-	-	133			4
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
M	83	1	-	-	1	-	-	-	-	-	2	-	-	-	66	56	42	2
	89	2	-	-	-	-	-	-	1	-	3	-	-	-	100	79	45	3
	97	1	-	-	1	-	-	1	-	-	3	-	-	-	60	-	-	3
	02	2	-	-	-	-	-	1	1	-	4	-	-	-	80	-	-	4
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	+34%
'89	00%	00%	00%	+ 0%
'97	00%	00%	00%	+ 0%
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)			Dec:	
	'83	66		-
	'89	100		-
	'97	100		-
	'02	100		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Leptodactylon pungens																		
S	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	3	-	-	-	-	-	-	-	-	3	-	-	-	100			3
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
Y	83	8	-	-	-	-	-	-	-	-	7	-	1	-	266			8
	89	5	-	-	-	-	-	-	-	-	5	-	-	-	166			5
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	83	56	-	-	-	-	-	-	-	-	56	-	-	-	1866	5	5	56
	89	78	-	-	-	-	-	4	-	-	82	-	-	-	2733	5	6	82
	97	2	-	-	-	-	-	-	-	-	2	-	-	-	40	10	26	2
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	2	-	-	-	-	-	-	-	-	2	-	-	-	66			2
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	1	-	-	-	-	-	-	-	-	-	-	-	1	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	02%	+28%
'89	00%	00%	00%	-98%
'97	00%	00%	00%	-67%
'02	00%	00%	100%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	2132	Dec:	0%
	'89	2965		2%
	'97	60		0%
	'02	20		100%

Pinus monophylla																		
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	
'89	00%	00%	00%	
'97	00%	00%	00%	
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	0	Dec:	-
	'89	0		-
	'97	0		-
	'02	20		-

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Sclerocactus																		
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	97	1	-	-	-	-	-	-	-	-	1	-	-	-	20	5	10	1
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20	7	12	1
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	1	-	-	-	-	-	-	-	-	1	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	
'89	00%	00%	00%	
'97	00%	00%	00%	+50%
'02	00%	00%	00%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	0	Dec:	0%
	'89	0		0%
	'97	20		0%
	'02	40		50%

Tetradymia canescens																		
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	1	-	-	-	-	-	1	-	-	2	-	-	-	66			2
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	83	12	-	-	-	-	-	-	-	-	6	-	6	-	400	18	19	12
	89	2	1	-	-	-	-	-	-	-	3	-	-	-	100	20	19	3
	97	3	-	-	-	-	-	-	-	-	-	-	3	-	60	20	25	3
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0	19	30	0
D	83	14	-	-	-	-	-	-	-	-	14	-	-	-	466			14
	89	7	4	-	-	-	-	1	-	1	10	1	1	1	433			13
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	02	1	-	-	-	-	-	1	-	-	1	-	-	1	40			2
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	40			2
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	20			1

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	23%	-31%
'89	28%	06%	11%	-90%
'97	00%	00%	100%	-33%
'02	00%	00%	50%	

Total Plants/Acre (excluding Dead & Seedlings)				
	'83	866	Dec:	54%
	'89	599		72%
	'97	60		0%
	'02	40		100%

AGE	YR	Form Class (No. of Plants) 1	2	3	4	5	6	7	8	9	Vigor Class 1	2	3	4	Plants Per Acre	Average (inches) Ht.	Cr.	Total
Tetradymia nuttallii																		
Y	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	1	-	-	-	-	-	-	-	1	-	-	-	33			1
	97	2	-	-	-	-	-	-	-	-	2	-	-	-	40			2
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
M	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0	-	-	0
	89	1	-	-	-	-	-	-	-	-	1	-	-	-	33	9	10	1
	97	2	-	-	-	-	-	1	-	-	3	-	-	-	60	18	23	3
	02	4	-	-	-	-	-	-	-	-	4	-	-	-	80	24	36	4
D	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	20	-	-	2	-	-	-	-	-	14	1	-	9	480			24
	02	6	-	-	1	-	-	3	-	-	2	-	-	8	200			10
X	83	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	89	-	-	-	-	-	-	-	-	-	-	-	-	-	0			0
	97	-	-	-	-	-	-	-	-	-	-	-	-	-	180			9
	02	-	-	-	-	-	-	-	-	-	-	-	-	-	200			10

% Plants Showing	Moderate Use	Heavy Use	Poor Vigor	%Change
'83	00%	00%	00%	
'89	50%	00%	00%	+89%
'97	00%	00%	31%	-52%
'02	00%	00%	57%	

Total Plants/Acre (excluding Dead & Seedlings)				
'83	0	Dec:		0%
'89	66			0%
'97	580			83%
'02	280			71%